

ABSTRACT

Steel for mechanical components, wherein the composition thereof is, in percentages by weight:

- $0.19\% \leq C \leq 0.25\%$;
- $1.1\% \leq Mn \leq 1.5\%$;
- $0.8\% \leq Si \leq 1.2\%$;
- $0.01\% \leq S \leq 0.09\%$;
- trace levels $\leq P \leq 0.025\%$;
- trace levels $\leq Ni \leq 0.25\%$;
- $1\% \leq Cr \leq 1.4\%$;
- $0.10\% \leq Mo \leq 0.25\%$;
- trace levels $\leq Cu \leq 0.30\%$;
- $0.010\% \leq Al \leq 0.045\%$;
- $0.010\% \leq Nb \leq 0.045\%$;
- $0.0130\% \leq N \leq 0.0300\%$;
- optionally trace levels $\leq Bi \leq 0.10\%$ and/or trace levels $\leq Pb \leq 0.12\%$ and/or trace levels $\leq Te \leq 0.015\%$ and/or trace levels $\leq Se \leq 0.030\%$ and/or trace levels $\leq Ca \leq 0.0050\%$;

the balance being iron and impurities resulting from the production operation, the chemical composition being adjusted so that the mean values J_{3m} , J_{11m} , J_{15m} and J_{25m} for five Jominy tests are such that:

$$\alpha = | J_{11m} - J_{3m} \times 14/22 - J_{25m} \times 8/22 | \leq 2.5 \text{ HRC; and}$$
$$\beta = J_{3m} - J_{15m} \leq 9 \text{ HRC.}$$

Method for producing a mechanical component using this steel and a mechanical component produced in this manner.

Figure 1.